



## **SITE VISIT REPORT**

**Date:** February 28, 2020

**To:** Norman Smith, Rich Zubyk – Norman Smith Architecture

**From:** Grant Beasley and Chris Snyder

**Reference:** Madison County MEP Site Visit Observations and Recommendations  
MEAD Project No. 558-1387

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We performed a site visit to the County Administration Building and the Old Health Department Building in the Madison County Administrative Complex located at 414 N. Main St, Madison, VA on February 24, 2020. We were provided drawings for the Old Health Department Building, but no drawings for the County Administration Building have been provided to us. The drawings for the Old Health Department Building indicate that it was constructed in 1995. The following are our Mechanical (HVAC), Electrical, and Plumbing observations followed by our recommendations on what should be considered by the county to be included in the project scope.

### **County Administration Building**

#### **HVAC Observations**

The building is served by six air-to-air split system heat pumps, electric wall heaters at the entryway doors, isolated electric baseboard heat, and exhaust at the toilet rooms. The capacity and age of each heat pump system was determined and are as follows

- (1) 2-ton heat pump manufactured in Oct/2019
- (1) 2-ton heat pump manufactured in Sept/2018
- (2) 3-ton heat pumps manufactured in June/2007
- (1) 5-ton heat pump manufactured in May/2012
- (1) 5-ton heat pump manufactured in July/2018.

The (2) 3-ton heat pumps that were manufactured in 2007 utilize refrigerant R-22. The others all utilize R-410A. Both the indoor air handlers and outdoor units they are served by are reportedly the same age. All equipment is reportedly working properly.

#### **HVAC Recommendations**

1. The two 5-ton split system heat pumps serve the Board of Supervisor's Meeting Room at the end of the building. The indoor air handling units are arranged horizontally in the attic space above the meeting room ceiling. Water stains were observed on the ceiling

tiles in the meeting room in an area near where the air handlers are located above. Given the highly confined space between attic roof structural framing where the indoor units are located, it was not possible to even reach the unit furthest away from the crawl-through access opening without possibly damaging the nearer unit by crawling over it. It would be extremely beneficial to have the indoor air handlers located within the larger attic space over the central part of the building in order to make service access for filter replacement and unit maintenance more convenient, less dangerous for maintenance personnel, reduce noise from the units in the meeting room, and eliminate the possibility of potential condensate leaks that may have been the cause of the stained ceiling tiles. Ductwork could be modified and extended to allow the units to tie back into the existing ductwork above the meeting room ceiling by creating openings through abandoned roof sheathing on the wood framing in the attic.

One of the 5-ton systems was recently replaced in 2018, but the other was manufactured in 2012. If the units are relocated to the larger attic it would make replacement of the units far more simple. The older unit is estimated to have about 7 years of remaining useful life, the newer one should be expected to last about 13 more years.

2. The estimated useful life of split system heat pump equipment is 15 years. Given their age of 13 years, and since both of the 3-ton split systems use R-22 refrigerant, their replacement should be considered while other modifications are made in the building to minimize disruption later on. Once the full scope of the changes being planned it may also be advantageous to make other HVAC system changes to better serve the final room arrangement.
3. The approximate useful life of wall heaters, baseboard heaters, and bathroom exhaust equipment is also estimated to be about 15 years and they appeared to be at about that age. Their replacement should be considered if the budget allows.

### Electrical Observations

The building electrical service is a 120/208 V, 3-phase, 4-wire service and is derived from a set of three Rappahannock Electric Co-op pole-mounted, 25 kVA transformers near the east corner of the building. The power company service wiring transitions underground at the pole and stubs up into a CT cabinet located in the crawlspace. From the CT cabinet, wiring is routed to a wireway in the electrical closet where it is distributed to three panelboards, summarized in the table below.

County Administration Building Panelboards			
Panel Name	Voltage/Phase	Amperage	Manufacturer
Box #1	120/208 V, 3-phase	350 Amp Main Breaker	Kinney
Box #2	120/208 V, 3-phase	300 Amp Main Breaker	Kinney
Box #3	120/208 V, 3-phase	150 Amp Main Breaker	Kinney

The combined capacity of 800 amps of the three panelboards at 120/208 V should be adequate for the renovation project, barring any major expansions of the building.

Lighting in the building mostly consists of fluorescent fixtures utilizing T12 lamps. Emergency

egress lighting is accomplished by wall-mounted, battery-backup fixtures. Interior lighting is controlled by light switches in each space.

Exterior lighting consists of building-mounted HID wallpacks. There are also pole-mounted fixtures around the complex which derive their power and control from the Administration Building electrical service. Exterior fixtures seem to be controlled by a combination of timeclocks and a photocell mounted in the soffit on the South end of the building.

A combination fire alarm/security system also exists in the building. The Fire Alarm Control panel was manufactured by Ademco and appears to be supported by newer, Honeywell devices.

### Electrical Recommendations

1. The manufacturer of the three panelboards, Kinney, is no longer in business. Retrofit breakers for Kinney panelboards manufactured by other companies are typically available, so no compatibility issues are anticipated with this project. There is no way to guarantee future breaker compatibility, so replacement of one or all of these panelboards should be considered if budget allows.
2. The lighting provided by fluorescent and HID sources should be upgraded to modern LED fixtures or at least re-lamped to utilize LED retrofit lamps. Recent pricing on LED fixtures is favorable and will result in a relatively short payback period when considering the energy savings of the fixtures. In addition, T12 fluorescent lamps have recently been made obsolete by legislation, so it will become more and more difficult to obtain replacement lamps.
3. Egress lighting in the Board of Supervisor's Meeting Room does not meet current code. Egress lighting should be designed into the re-designed general lighting of the space.

### Plumbing Observations

Potable water is reportedly served from the municipal water authority from piping to the northwest run below grade somewhere along the entry side of the building based on information provided by County service personnel during our site visit. Some abandoned water service equipment and piping was observed in the crawlspace but it could not be determined where the actual service entrance is located and no backflow protection was observed. Sanitary sewer reportedly ties into County sewer at a manhole located in the parking lot in front of the building. Existing piping that could be observed in the crawlspace and in the attic included bell and spigot cast iron drain, waste, vent piping with some cellular core PVC piping in the attic area. Potable water piping observed at the 50 tank-type electric domestic water heater was thought to be copper however, it was insulated and it could not be determined if all or most water supply piping is also copper. Plumbing fixtures appeared to be in fair condition although some faucets and sinks will likely need attention or replacement in the near future. The water heater had a manufacture date of Oct/2013. No expansion tank was observed at the water heater. A high-low electric water cooler was observed in the central hallway and appeared to be in good condition.

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### Plumbing Recommendations

1. The age of the existing plumbing piping could not be determined, but it appears that some (possibly most) of the piping is about 50 years old. At this age it should be expected that some parts of the piping systems will fail. This could do damage to surface finishes and furnishings in the renovated building if left as-is. Replacement of as much of the plumbing piping as possible should be considered.
2. At a minimum, the existing sanitary piping below the floor should be scoped to document the sizes, slope and condition of all the underfloor piping so that repairs can be made later when necessary. Damaged, inadequate line sizes, or improperly sloped piping should be replaced. This may be necessary in some areas if only to accommodate the handicapped accessible toilet changes being planned.
3. Since we were unable to identify any backflow prevention device on the water supply to the building, it may be necessary to install one on the system at the source to comply with current codes. If one does exist and it complies with current backflow prevention requirements, this would not be necessary. We assume that the existing service is of sufficient size and pressure to accommodate the planned for the renovation.
4. The existing water heater has an expected useful life of 8 more years. An expansion tank should be installed on the system at the water heater.
5. We did not observe any water hammer arrestors on the water supply piping. Their age and condition should be verified. If necessary new water hammer arrestors should be installed on supply piping serving flush valve fixtures.

### **Old Health Department Building**

#### HVAC Observations

The building is served by four air-to-air split system heat pumps, one thru-the-wall packaged terminal heat pump (PTHP), isolated electric baseboard heat, and exhaust fans at toilet rooms. The systems appeared to have been installed as shown on the drawings we observed. The capacity and age of each heat pump system was determined and are as follows.

- (1) 4-ton heat pump manufactured in May/2012
- (1) 5-ton heat pump manufactured in Dec/2018
- (1) 4-ton heat pump manufactured in Jan/1995
- (1) heat pump manufactured in April/2007
- (1) 7,000 BTUH packaged terminal heat pump that appeared to original to the 1995 building construction date.

The heat pumps manufactured in 1995 and 2007 utilize refrigerant R-22. The heat pumps manufactured in 2012 and 2018 utilize refrigerant R-410A. Other than the 5-ton indoor air handling unit manufactured in Jan/2019 that is served by the heat pump manufactured in Dec/2018, all other air handlers appeared to be original to the 1995 building construction. The original split system air handlers were observed to have humidifiers and electronic air cleaners

that reportedly no longer work, were problematic to maintain, and are not needed according to County service personnel. The baseboard heat and fans appeared to be original equipment installed in 1995. Other than the humidifiers and electronic air cleaners, all other equipment is reportedly working properly.

#### HVAC Recommendations

1. All split system heat pump equipment that was installed before 2005 should be replaced if the budget allows. The anticipated useful life of this type of equipment is approximately 15 years.

#### Electrical Observations

The building electrical service is a 120/240 V, 1-phase, 3-wire service and is derived from a set pad-mounted Rappahannock Electric Co-op transformer on the north side of the building. The power company service wiring extends underground to a CT cabinet located on the North wall of the building. From the CT cabinet, wiring is through the wall to a Main Distribution electrical panelboard in the electrical/mechanical room. A summary of the panelboards in the building is below.

Old Health Department Building Panelboards			
Panel Name	Voltage/Phase	Amperage	Manufacturer, Model
MDP	120/240 V, 1-phase	800 Amp Main Breaker	Square D I-Line
Panel A	120/240 V, 3-phase	200 Amp Main Breaker	Square D QO
Panel B	120/240 V, 3-phase	200 Amp Main Breaker	Square D QO

The capacity of the 800 amps service at 120/240 V should be adequate for the renovation project, barring any major expansions of the building. All the panels are still in production by Square D, so serviceability is a non-issue.

Lighting in the building mostly consists of fluorescent fixtures utilizing T12 lamps. Emergency egress lighting is accomplished by ceiling, battery-backup fixtures located throughout public areas. Interior lighting is controlled by light switches in each space.

Exterior lighting consists of building-mounted HID wallpacks. There are also pole-mounted fixtures in the parking lot. All exterior fixtures are controlled by timeclocks in the electrical room.

A fire alarm detection and alarm system also exists in the building. The Fire Alarm Control panel was manufactured by Silent Knight which is currently supportable.

The drawings provided were spot checked and proved to be accurate for existing conditions.

#### Electrical Recommendations

1. The lighting provided by fluorescent and HID sources should be upgraded to modern LED fixtures or at least re-lamped to utilize LED retrofit lamps. Recent pricing on LED fixtures is favorable and will result in a relatively short payback period when considering the energy savings of the fixtures. In addition, T12 fluorescent lamps have recently been

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made obsolete by legislation, so it will become more and more difficult to obtain replacement lamps.

### Plumbing Observations

Potable water is reportedly served from the municipal water authority and enters the building through the floor beneath a large break room at the southeast end of the building. A backflow preventer was observed with shut-off valves, pressure test taps and strainer located beneath the counter within a cabinet in the break room. An air gap and drain were observed at the backflow device piped to drain through the wall to outdoors. Sanitary sewer is reportedly run to a sewage lift pump located outdoors near the east corner of the building. From there the sewer reportedly runs uphill to the manhole located in the parking lot in front of the Administrative office building. A propane tank was observed on a pad behind the building near the north corner and was reportedly used previously to serve a generator. A gas pressure regulator was also observed on the building in the vicinity of the propane tank. A vacuum pump and anesthetic gas manifold were observed in a closet within the building. Piping was also observed protruding from the floor slab in one of the treatment rooms that may have been connected to the vacuum and anesthetic gas system. Potable water piping observed at the 50 tank-type electric domestic water heater is sweat-fit copper. The water heater had a manufacture date of July/1995. An expansion tank was observed at the water heater. It is believed that potable water piping is copper throughout the building. Sanitary piping could not be observed but is believed to be PVC throughout. All plumbing fixtures appeared to be in good condition. An electric water cooler was observed in the lobby space and appeared to be in good condition.

### Plumbing Recommendations

1. It should be expected that the electric water heater will need replacement in the near future since it is 25 years old. When it is replaced, it should be installed in a drain pan with a drain piped to the sanitary system.
2. Exposed piping located in open floor spaces should be demolished, capped and covered as necessary to eliminate trip hazards.